IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Applicant: Jeffrey Allen Cooper

Examiner: Pe, Geepy

Serial No: 10/535,112

Group Art Unit: 2621

Filed: May 16, 2005

Docket: PU020467

For: METHOD AND SYSTEM FOR STAGGERED STATISTICAL MULTIPLEXING

Mail Stop Appeal Brief-Patents
Hon. Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

Applicant appeals the status of Claims 16, 17, 20, 21, 22, and 23 as rejected in the non-final Office Action dated June 12, 2009, the non-final Office Action dated July 28, 2009, and the final Office Action dated November 10, 2009, pursuant to the Notice of Appeal filed concurrently herewith and submit this appeal brief.

TABLE OF CONTENTS:

C4. Claim 23

D. Conclusion

8. CLAIMS APPENDIX

9. RELATED EVIDENCE APPENDIX

10. RELATING PROCEEDINGS APPENDIX

1. Real Party in Interest

The real party in interest is THOMSON LICENSING S.A., the assignee of the entire right title and interest in and to the subject application by virtue of an assignment recorded with the Patent Office on May 16, 2005 at reel/frame 017042/0938.

2. Related Appeals and Interferences

None

3. Status of Claims

Claims 5-7 and 9-24 are pending, Claims 1-4 are withdrawn, and Claim 8 is cancelled. Claims 5-7 and 9-24 stand rejected. Of the rejected claims, Claims 16 and 17, 20, 21, 22, and 23 are under appeal. A copy of the Claims 1-7 (including withdrawn Claims 1-4) and 9-24 is presented in Section 8 below.

4. Status of Amendments

A Preliminary Amendment under 37 CFR §1.115, filed with the PTO on May 16, 2005, was entered. An amendment, filed with the PTO on June 22, 2009 in response to a non-final Office Action (specifying a restriction requirement and) dated June 12, 2009, was entered. An Amendment under 37 CFR §1.111, filed with the PTO on September 21, 2009 in response to a non-final Office Action dated July 28, 2009, was entered. No Responses/Amendments were filed subsequent to the above Amendment filed on September 21, 2009. A final Office Action dated November 10, 2009, to which this Appeal Brief is directed, is currently pending.

5. Summary of Claimed Subject Matter

Independent Claim 5 is directed to "[i]n a video transmission system in which video segments are encoded into a plurality of frame types, a method for arranging frame transmission alignment among a plurality of channels concurrently transmitted via a common transmission medium" (Claim 5, preamble).

The subject matter of the first element (beginning with "identifying") recited in Claim 5 is described, e.g., at: page 4, lines 4-8; and page 7, lines 8-11. Moreover, the subject matter of the first element of Claim 5 involves, e.g.: elements INTRA of FIG. 4.

The subject matter of the second element (beginning with "causing") recited in Claim 5 is described, e.g., at: page 3, lines 1-2; page 4, lines 4-8; and page 5, lines 22-30. Moreover, the subject matter of the second element of Claim 5 involves, e.g.: elements INTRA of FIG. 4.

The subject matter of the third element (beginning with "wherein") recited in Claim 5 is described, e.g., at: page 8, lines 3-5. Moreover, the subject matter of the third element of Claim 5 involves, e.g.: element NUMBER OF CHANNELS and element GOP LENGTHS of FIG. 6.

Independent Claim 15 is directed to "[i]n a video transmission system in which video segments are encoded into a plurality of frame types, an apparatus for arranging frame transmission alignment among a plurality of channels concurrently transmitted via a common transmission medium" (Claim 15, preamble).

The subject matter of the first element (beginning with "means for identifying") recited in Claim 15 is described, e.g., at: page 4, lines 4-8; and page 7, lines 8-11. Moreover, the subject matter of the first element of Claim 15 involves, e.g.: element 101 of FIG. 1; and elements INTRA of FIG. 4.

The subject matter of the second element (beginning with "means for causing") recited in Claim 15 is described, e.g., at: page 3, lines 1-2; page 4, lines 4-8; and page 5, lines 22-30. Moreover, the subject matter of the second element of Claim 15 involves, e.g.: element 105 of FIG. 1; and elements INTRA of FIG. 4.

The subject matter of the third element (beginning with "wherein") recited in Claim 15 is described, e.g., at: page 8, lines 3-5. Moreover, the subject matter of the third element of Claim 15 involves, e.g.: element NUMBER OF CHANNELS and element GOP LENGTHS of FIG. 6.

Dependent Claim 16 is directed to "[i]n a video transmission system in which video segments are encoded into a plurality of frame types, a method for arranging frame transmission alignment among a plurality of channels concurrently transmitted via a common transmission medium" (Claim 5 preamble, from which Claim 16 depends).

The subject matter of the first element (beginning with "wherein") recited in Claim 16 is described, e.g., at: page 7, lines 24-26. Moreover, the subject matter of the first element of Claim 16 involves, e.g.: element NUMBER OF CHANNELS and element GOP LENGTHS of FIG. 6.

Dependent Claim 17 is directed to "[i]n a video transmission system in which video segments are encoded into a plurality of frame types, an apparatus for arranging frame transmission alignment among a plurality of channels concurrently transmitted via a common transmission medium" (Claim 15 preamble, from which Claim 17 depends).

The subject matter of the first element (beginning with "wherein") recited in Claim 17 is described, e.g., at: page 7, lines 24-26. Moreover, the subject matter of the first element of Claim 17 involves, e.g.: element NUMBER OF CHANNELS and element GOP LENGTHS of FIG. 6.

Dependent Claim 20 is directed to "[i]n a video transmission system in which video

segments are encoded into a plurality of frame types, an apparatus for arranging frame transmission alignment among a plurality of channels concurrently transmitted via a common transmission medium" (Claim 15 preamble, from which Claim 20 depends).

The subject matter of the first element (beginning with "wherein") recited in Claim 20 is described, e.g., at: page 9, line 15 to page 10, line 2. Moreover, the subject matter of the first element of Claim 20 involves, e.g.: elements 701, 703, and 705 of FIG. 7.

Dependent Claim 21 is directed to "[i]n a video transmission system in which video segments are encoded into a plurality of frame types, an apparatus for arranging frame transmission alignment among a plurality of channels concurrently transmitted via a common transmission medium" (Claim 15 preamble, from which Claim 21 depends).

The subject matter of the first element (beginning with "wherein") recited in Claim 21 is described, e.g., at: page 4, lines 9-18; and page 9, lines 21-22. Moreover, the subject matter of the first element of Claim 21 involves, e.g.: elements 701 and 709 of FIG. 7.

Dependent Claim 22 is directed to "[i]n a video transmission system in which video segments are encoded into a plurality of frame types, an apparatus for arranging frame transmission alignment among a plurality of channels concurrently transmitted via a common transmission medium" (Claim 15 preamble, from which Claim 22 (indirectly) depends).

The subject matter of the first element (beginning with "wherein") recited in Claim 22 is described, e.g., at: page 9, lines 24-25. Moreover, the subject matter of the first element of Claim 22 involves, e.g.: element 703 of FIG. 7.

Dependent Claim 23 is directed to "[i]n a video transmission system in which video segments are encoded into a plurality of frame types, an apparatus for arranging frame

transmission alignment among a plurality of channels concurrently transmitted via a common transmission medium" (Claim 15 preamble, from which Claim 23 (indirectly) depends).

The subject matter of the first element (beginning with "wherein") recited in Claim 23 is described, e.g., at: page 9, line 15 to page 10, line 2. Moreover, the subject matter of the first element of Claim 23 involves, e.g.: elements 705 and 709 of FIG. 7.

6. Grounds of Rejection to be Reviewed on Appeal

Claims 5-7 and 9-17 stand rejected under 35 U.S.C. 102(b) as being anticipated by Krunz et al., "Impact of video scheduling on bandwidth allocation for multiplexed MPEG streams" (hereinafter "Krunz").

Claims 18 and 19 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Krunz in view of Roh et al., "Starting Time Selection and Scheduling Methods for Minimum Cell Loss Ratio of Superposed VBR MPEG Video Traffic" (hereinafter "Roh").

Claims 20-24 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Krunz in view of U.S. Patent No. 4,002,845 to Kaul (hereinafter "Kaul").

The preceding rejections under 35 U.S.C. §102(b) and §103(a) relating to Claims 16, 17, 20, 21, 22, and 23 are presented for review in this Appeal.

Regarding the grouping of the claims, each of the aforementioned appealed claims, namely Claims 16, 17, 20, 21, 22, and 23, respectively stand or fall alone.

7. Argument

A. Introduction

In general, the present invention is directed to a method and apparatus for staggered statistical multiplexing (Applicant's Specification, Title). As disclosed in the Applicant's specification at page 2, lines 8-19:

> Video complexity is very bursty and stat mux can enable a broadcaster to achieve high quality during the high-complexity video segments on a given channel. Even more valuable, a broadcaster can fit more video channels into the transmission bandwidth. That is, by taking advantage of the average video complexity being low on most channels, extra space is made to increase the number of video channels.
>
> The determination of which channel should receive the most bits is difficult, however, especially in a real time encoding system for broadcast. Most known solutions take a complexity measure from the input video frames on each channel, and then allocate a fixed number of bits for use on the channel over the next group of pictures (normally 12 or 15 video frames) or sometimes on the next picture. Because these systems are not frame synchronized (and even if they were), at any given stat mux allocation time, the type of frames requesting bits is a variable.

The appealed claims of the pending invention include novel features not shown in the cited references and that have already been pointed out to the Examiner. These features provide advantages over the prior art and dispense with prior art problems such as those described above with reference to the Applicant's specification.

It is respectfully asserted that pending appealed Claims 16, 17, 20, 21, 22, and 23 are each

patentably distinct and non-obvious over the cited references in their own right. For example, the below-identified limitations of independent Claims 16, 17, 20, 21, 22, and 23 are not shown in any of the cited references, either taken singly or in any combination. Moreover, these Claims are distinct from each other in that they are directed to different implementations and/or include different limitations. For example, Claim 16 is directed to a method (Claim 16, preamble), while Claims 17, 20, 21, 22, and 23 are directed to an apparatus (Claims 17, 20, 21, 22, and 23, respective preambles). Moreover, each of these claims includes different limitations with respect to each other. Accordingly, each of Claims 16, 17, 20, 21, 22, and 23 represent separate features/implementations of the invention that are separately novel and non-obvious with respect to the prior art and to the other claims. As such, Claims 16, 17, 20, 21, 22, and 23 are separately patentable and are each presented for review in this appeal.

B. Whether Claims 16 and 17, From Among Rejected Claims 5-7 and 9-17, are Anticipated Under 35 U.S.C. §102(b) With Respect To Krunz et al., "Impact of video scheduling on bandwidth allocation for multiplexed MPEG streams"

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." MPEP §2131, citing Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). If such a showing cannot be made, then a *prima facie* anticipation rejection has not been made and the rejection cannot be sustained.

The Examiner rejected Claims 5-7 and 9-17 as being unpatentable over Krunz et al., "Impact of video scheduling on bandwidth allocation for multiplexed MPEG streams" (hereinafter

"Krunz"). The Examiner contends that Krunz shows all the limitations recited in Claims 5-7 and 9-17.

Krunz is directed to the "Impact of video scheduling on bandwidth allocation for multiplexed MPEG streams" (Krunz, Title). In further detail, Krunz discloses the following in his Abstract:

> We present efficient schemes for scheduling the delivery of variable-bit-rate MPEG-compressed video with stringent quality-of-service (QoS) requirements. Video scheduling is being used to improve bandwidth allocation at a video server that uses statistical multiplexing to aggregate video streams prior to transporting them over a network. A video stream is modeled using a traffic envelope that provides a deterministic time-varying bound on the bit rate. Because of the periodicity in which frame types in an MPEG stream arc typically generated, a simple traffic envelope can be constructed using only five parameters. Using the traffic-envelope model, we show that video sources can be statistically multiplexed with an *effective bandwidth* that is often less than the source peak rate. Bandwidth gain is achieved without sacrificing the stringency of the requested QoS. The effective bandwidth depends on the *arrangement* of the multiplexed streams, which is a measure of the lag between the GOP periods of various streams. For homogeneous streams, we give an optimal scheduling scheme for video sources at a video-on-demand server that results in the minimum effective bandwidth. For heterogeneous sources, a sub-optimal scheduling scheme is given, which achieves acceptable bandwidth gain. Numerical examples based on traces of MPEG-coded movies are used to demonstrate the effectiveness of our schemes.

Of rejected Claims 5-7 and 9-17, it will be shown herein below that the limitations of Claims 16 and 17 reproduced herein are not shown in the cited reference, and that Claims 16 and 17 should be allowed.

B1. Claims 16 and 17

It is respectfully asserted that that none of the cited references, either taken singly or in combination, teach or suggest the following limitations of Claims 16 and 17: "wherein said fixed number of frame positions is equal to the number of said plurality of channels, such that the integer multiple is equal to one."

It is respectfully noted that Claims 16 and 17 depend from Claims 5 and 15, respectively, which recite, *inter alia*, "[i]n a video transmission system in which **video segments are encoded into a *plurality of frame types***, a method (Claim 5) / an apparatus (Claim 15) for arranging frame transmission alignment among a plurality of channels concurrently transmitted via a common transmission medium" (emphasis added).

Against the preceding limitations of Claims 16 and 17, the Examiner has cited Krunz, page 348, right column, section 2, line 42 which discloses the following: "[n]otice that it is possible to have L=Q=1, in which case only I-frames are generated (i.e., JPEG-like stream)." As is immediately evident, the cited portion of Krunz does not teach or suggest the claimed limitation. Even though it is not necessarily germane to an the anticipation argument, it is extremely interesting to not that Krunz not only does not teach or suggest the claimed limitation, but actually TEACHES AWAY from, the explicit limitations of Claims 16 and 17 (again noting that they each respectively depend from Claims 5 and 15, which each recite a plurality of frame

types). That is, while the cited portion of Krunz is limited to streams that include ONLY I-frames, the explicit claim limitations of Claims 16 and 17 require a plurality of frame types.

Hence, Krunz does not disclose the preceding limitations of Claims 16 and 17. Moreover, it is respectfully asserted that none of the remaining references cure the deficiencies of Krunz, and are silent with respect to the above reproduced limitations of Claim 16 and 17. Thus, none of the cited references teach or suggest all of the above reproduced limitations of Claims 16 and 17. Since such a showing has not been made, consequently the Examiner has not established a proper *prima facie* anticipation rejection and the rejection cannot be sustained.

Accordingly, Claims 16 and 17 are patentably distinct (and, in fact, also non-obvious) over the cited references for at least the reasons set forth above. Therefore, withdrawal of the rejection and allowance of Claims 16 and 17 is earnestly requested.

C. Whether Claims 20-23, From Among Rejected Claims 20-24, are Unpatentable Under 35 U.S.C. §103(a) With Respect to Krunz et al., "Impact of video scheduling on bandwidth allocation for multiplexed MPEG streams" in view of Roh et al., "Starting Time Selection and Scheduling Methods for Minimum Cell Loss Ratio of Superposed VBR MPEG Video Traffic"

The failure of an asserted combination to teach or suggest each and every feature of a claim remains fatal to an obviousness rejection under 35 U.S.C. § 103. Section 2143.03 of the MPEP requires the "consideration" of every claim feature in an obviousness determination. To render a claim unpatentable, however, the Office must do more than merely "consider" each and

every feature for this claim. Instead, the asserted combination of the patents must also teach or suggest *each and every claim feature*. *See In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974) (emphasis added) (to establish *prima facie* obviousness of a claimed invention, all the claim features must be taught or suggested by the prior art). Indeed, as the Board of Patent Appeal and Interferences has recently confirmed, a proper obviousness determination requires that an Examiner make "a searching comparison of the claimed invention - *including all its limitations* - with the teaching of the prior art." *See In re Wada and Murphy*, Appeal 2007-3733, *citing In re Ochiai*, 71 F.3d 1565, 1572 (Fed. Cir. 1995) (emphasis in original). If such a showing cannot be made, then a *prima facie* obviousness rejection has not been made and the rejection cannot be sustained.

"If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious" (MPEP §2143.03, citing *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)).

The Examiner rejected Claims 20-24 as being unpatentable over Krunz et al., "Impact of video scheduling on bandwidth allocation for multiplexed MPEG streams" (hereinafter "Krunz") in view of Roh et al., "Starting Time Selection and Scheduling Methods for Minimum Cell Loss Ratio of Superposed VBR MPEG Video Traffic" (hereinafter "Roh"). The Examiner contends that the cited combination shows all the limitations recited in Claims 20-24.

Krunz is directed to the "Impact of video scheduling on bandwidth allocation for multiplexed MPEG streams" (Krunz, Title). In further detail, Krunz discloses the following in his Abstract:

We present efficient schemes for scheduling the delivery of variable-bit-rate MPEG-compressed video with stringent quality-of-service (QoS) requirements. Video scheduling is being used to improve bandwidth allocation at a video server that uses statistical multiplexing to aggregate video streams prior to transporting them over a network. A video stream is modeled using a traffic envelope that provides a deterministic time-varying bound on the bit rate. Because of the periodicity in which frame types in an MPEG stream arc typically generated, a simple traffic envelope can be constructed using only five parameters. Using the traffic-envelope model, we show that video sources can be statistically multiplexed with an *effective bandwidth* that is often less than the source peak rate. Bandwidth gain is achieved without sacrificing the stringency of the requested QoS. The effective bandwidth depends on the *arrangement* of the multiplexed streams, which is a measure of the lag between the GOP periods of various streams. For homogeneous streams, we give an optimal scheduling scheme for video sources at a video-on-demand server that results in the minimum effective bandwidth. For heterogeneous sources, a sub-optimal scheduling scheme is given, which achieves acceptable bandwidth gain. Numerical examples based on traces of MPEG-coded movies are used to demonstrate the effectiveness of our schemes.

Roh is directed to "Starting Time Selection and Scheduling Methods for Minimum Cell Loss Ratio of Superposed VBR MPEG Video Traffic" (Roh, Title). In further detail, Roh discloses the following in his Abstract:

The arrangement of I-picture starting times of multiplexed variable bit rate (VBR) MPEG videos may significantly affect the cell loss ratio (CLR) characteristics of superposed traffic. In this paper, we deal with the problems due to the starting time arrangement of VBR MPEG videos. VBR MPEG video traffic

is modeled by a sequence with time-varying and periodic picture-type dependent rate envelopes. From extensive investigations into the relationships between the starting time arrangement and the queueing performance, it is shown that the average power of superposed VBR MPEG video traffic can be a good measure for the burstiness of the traffic. Then, we can derive a starting time selection method for a newly requested VBR MPEG video that can minimize the CLR as well as the peak cell rate of the superposed traffic including the new request itself, and an efficient scheduling method called MC-scheduling is also proposed as an application of the starting time selection method. The exactness and efficiencies of the proposed methods are shown by comparing them with other scheduling methods in terms of the smoothness and the CLR performances.

Of rejected Claims 20-24, it will be shown herein below that the limitations of Claims 20-23 reproduced herein are not shown in the cited references, and that Claims 20-23 should be allowed.

C1. Claim 20

It is respectfully asserted that that none of the cited references, either taken singly or in combination, teach or suggest the following limitations of Claim 20:

wherein said causing means comprises a frame rate counter, a plurality of phase registers, and a plurality of comparators, wherein the frame rate counter has an output connected in signal communication with a first input of each of the plurality of comparators, and each of the plurality of phrase registers has a respective output that is connected in signal communication with a second input of a respective one of the plurality of comparators.

For example, the Examiner has admitted that Krunz does not teach or suggest the explicit preceding limitations recited in Claim 20, but has nonetheless relied upon Krunz for teaching the following: "counting the frame and bit rates…, which would suggest a frame rate counter, and having phase slots…, which would suggest a plurality of phase registers" (Office Action, p. 5). The Examiner continued that "Kaul teaches means to compare … for the benefit of detecting loss of synchronization… (Office Action, p. 5). The Examiner further reasoned on pages 5-6 of the Office Action that:

> [I]t would have been obvious to one of ordinary skill in the art at the time the invention was made that said causing means comprises a frame rate counter, a plurality of phrase registers, and a plurality of comparators, where the frame rate counter has an output connected in signal communication with a first input of each of the plurality of comparators, and each of the plurality of phase registers has a respective output that is connected in signal communication with a second input of a respective one of the plurality of comparators in the Krunz invention, as shown in Krunz and Kaul, for the benefit of detecting a loss of synchronization.

However, the causing means recited in Claim 20 as comprising the frame rate counter, the plurality of phase registers, and the plurality of comparators is initially recited in Claim 15 (from which it depends) as "means for causing ones of said specified frame type to be arranged so as to avoid temporal alignment with other ones of said specified frame type in corresponding other ones of said plurality of channels." Hence, the means for causing recited in Claim 15 is not for detecting a loss of synchronization but rather for causing a particular frame type temporal

arrangement as explicitly recited in Claim 15. That is, the means for causing recited in Claim 15 is explicitly recited therein as having a purpose of "causing ones of said specified frame type to be arranged so as to avoid temporal alignment with other ones of said specified frame type in corresponding other ones of said plurality of channels" and NOT for detecting a loss of synchronization as proposed by the Examiner with respect to the combination of references. That is, a means for causing something (ones of said specified frame type) to be arranged in a particular way (so as to avoid alignment with other ones of said specified frame type in corresponding other ones of said plurality of channels") as essentially recited in Claim 20 does NOT correspond to a means for detecting a problem (loss of synchronization) as proposed by the Examiner.

Moreover, the alleged existence of phase slots in Krunz without more does not teach or suggest phase registers as proposed by the Examiner, let alone the detailed limitations involving the same recited in Claim 20.

Thus, neither Krunz nor Kaul teach or suggest the above recited limitations of Claim 20. Moreover, it is respectfully asserted that none of the remaining references cure the deficiencies of Krunz and/or Kaul, and are silent with respect to the above reproduced limitations of Claim 20. Thus, none of the cited references teach or suggest all of the above reproduced limitations of Claim 20. Since such a showing has not been made, consequently the Examiner has not established a proper *prima facie* obviousness rejection and the rejection cannot be sustained.

Accordingly, Claim 20 is patentably distinct and non-obvious over the cited combination for at least the reasons set forth above. Therefore, withdrawal of the rejection and allowance of Claim 20 is earnestly requested.

C2. Claim 21

It is respectfully asserted that that none of the cited references, either taken singly or in combination, teach or suggest the following limitations of Claim 21: "wherein the video segments are operated on by corresponding ones of channel video encoders, and the frame rate counter synchronizes reset signals associated with the channel video encoders."

Nonetheless, the Examiner has cited column 2, lines 37-40 of Kaul as disclosing the same. The Applicants respectfully disagree. For example, Column 2, lines 30-40 of Kaul disclose the following (emphasis added):

> **In order to monitor the condition of the N bit shift register a counter is operated by the distinctive outputs of the shift register**. The counter provides three outputs, one which indicates it is storing a count of one, a second which indicates it is storing a count of two and an indication of a count of zero. The two count output is employed to inhibit further counting of the counter. The counter is reset at a rate equivalent to the frame rate. **A memory means monitors the state of the counter which memory means is reset by the two count output of the counter**. If, at the conclusion of any frame period the counter has counted up to only one, the memory means is distinctively conditioned to indicate that the possible framing bit positions candidates have been narrowed down to one. At the same time of the next occurrence of that bit position the conjoint action of the memory means output and the N bit shift register output identifies the framing bit position. With that information a counter is reset which thereafter produces framing pulses at the frame rate.

Hence, while the frame rate counter recited in Claim 21 synchronizes reset signals

associated with channel video encoders, the counter disclosed in Kaul is used to monitor the condition of a N bit register and NOT to synchronize resets signals associated with channel video encoders as recited in Claim 21. For example, to the extent that the cited portion resets anything, such resetting is described with respect to the memory means that monitors the state of the counter and with respect to the counter itself, but is NOT described with respect to synchronizing resets signals associated with channel video encoders as recited in Claim 21. This is not surprising, since Kaul is directed to a "frame synchronizer [] disclosed for searching for the framing bits of an N bit frame in a stream of binary signals" (Kaul, Abstract) and NOT to encoding. For that matter, Kaul does not even include one occurrence of the word "encode" or the word "encoder", let alone the detailed limitations recited in Claim 21.

Thus, Kaul does not teach or suggest the above recited limitations of Claim 21. Moreover, it is respectfully asserted that none of the remaining references cure the deficiencies of Kaul, and are silent with respect to the above reproduced limitations of Claim 21. Thus, none of the cited references teach or suggest all of the above reproduced limitations of Claim 21. Since such a showing has not been made, consequently the Examiner has not established a proper *prima facie* obviousness rejection and the rejection cannot be sustained.

Accordingly, Claim 21 is patentably distinct and non-obvious over the cited combination for at least the reasons set forth above. Therefore, withdrawal of the rejection and allowance of Claim 21 is earnestly requested.

C3. Claim 22

It is respectfully asserted that that none of the cited references, either taken singly or in

combination, teach or suggest the following limitations of Claim 22: "wherein ones of the plurality of registers are loaded with frame offset values corresponding to a selected frame stagger for an associated one of the plurality of channels."

Against the explicit and detailed limitations of Claim 22, which it is respectfully pointed out is dependent from Claim 20 (which, in turn, is dependent from Claim 15), the Examiner cited "Krunz, p. 350, section 4.1, lines 1-5: a frame delay to cause a stagger". In its entirety, the cited sentence from Krunz that mentioned the delay discloses that "[a]lignment of frame boundaries can be enforced by introducing a fixed amount of delay (less than one frame period) in the path of a video connection before entering the multiplexer" (Krunz, p. 350, section 4.1, lines 3-6). From such disclosure of Krunz, it is clear that Krunz does not teach or even remotely suggest that such delay involves a plurality of registers, let alone a "plurality of registers [that] are loaded with frame offset values corresponding to a selected frame stagger for an associated one of the plurality of channels" as explicitly recited in Claim 22, keeping in mind that these same registers each have a respective output that is connected in signal communication with a second input of a respective ones of the plurality of comparators as recited in Claim 20 from which Claim 22 depends. For example, Krunz does not include even one hardware figure or element in his entire disclosure. Moreover, Krunz does not include even one occurrence of the word "register". Thus, it would seem that the Examiner has taken an erroneous and impermissibly broad reading of the references to say that the preceding cursory disclosure of Krunz applied to Claim 22 (as well as that applied to Claim 20 from which Claim 22 depends and, thus, also incorporates the limitations thereof) somehow suggests all the same specific elements in all the same specific configurations recited in Claim 22 as proposed by the Examiner.

Thus, Krunz does not teach or suggest the above reproduced limitations of Claim 22. Moreover, it is respectfully asserted that none of the remaining references cure the deficiencies of Krunz, and are silent with respect to the above reproduced limitations of Claim 22. Thus, none of the cited references teach or suggest all of the above reproduced limitations of Claim 22. Since such a showing has not been made, consequently the Examiner has not established a proper *prima facie* obviousness rejection and the rejection cannot be sustained.

Accordingly, Claim 22 is patentably distinct and non-obvious over the cited combination for at least the reasons set forth above. Therefore, withdrawal of the rejection and allowance of Claim 22 is earnestly requested.

C4. Claim 23

It is respectfully asserted that that none of the cited references, either taken singly or in combination, teach or suggest the following limitations of Claim 23: "wherein ones of the plurality of comparators are functionally associated with ones of the channel video encoders, the plurality of comparators being operative to provide a timing signal as an output corresponding to the selected frame stagger for the associated one of the plurality of channels."

Nonetheless, the Examiner has cited Figure 3 of Kaul as disclosing the same, stating with respect to Figure 3 of Kaul that "there are clocks which provide timing signals". The Applicant respectfully disagrees. For example, the fact that Figure 3 of Kaul may show clocks which provide timing signals does not rise to teaching or even remotely suggesting that "ones of the plurality of comparators are functionally associated with ones of the channel video encoders, the plurality of comparators being operative to provide a timing signal as an output corresponding to

the selected frame stagger for the associated one of the plurality of channels". For example, Kaul does not include even one occurrence of the word "encode" or the word "encoder" and, thus, cannot show the preceding limitations of Claim 23 which explicitly recite and hence involve channel video encoders, as well as, a recited association between ones of the channel video encoders and ones of a plurality of comparators, and so forth.

Thus, Kaul does not teach or suggest the above recited limitations of Claim 23. Moreover, it is respectfully asserted that none of the remaining references cure the deficiencies of Kaul, and are silent with respect to the above reproduced limitations of Claim 23. Thus, none of the cited references teach or suggest all of the above reproduced limitations of Claim 23. Since such a showing has not been made, consequently the Examiner has not established a proper *prima facie* obviousness rejection and the rejection cannot be sustained.

Accordingly, Claim 23 is patentably distinct and non-obvious over the cited combination for at least the reasons set forth above. Therefore, withdrawal of the rejection and allowance of Claim 23 is earnestly requested.

D. Conclusion

At least the above-identified limitations of the pending claims are not disclosed or suggested by the teachings of the cited references. Accordingly, it is respectfully requested that the Board reverse the rejections of Claims 16, 17, 20, 21, 22, and 23 under 35 U.S.C. §102(b) and §103(a).

Please charge the amount of $540.00, covering fee associated with the filing of the Appeal Brief, to **Thomson Licensing Inc., Deposit Account No. 07-0832**. In the event of any non-payment or improper payment of a required fee, the Commissioner is authorized to charge **Deposit Account No. 07-0832** as required to correct the error.

Respectfully submitted,

BY: /Guy H. Eriksen/
Guy H. Eriksen, Attorney for Applicant
Registration No.: 41,736
Telephone No.: (609) 734-6807

Thomson Licensing Inc.
Patent Operations
P.O. Box 5312
Princeton, NJ 08543-5312

December 21, 2009

8. CLAIMS APPENDIX

1. (withdrawn) In a multi-channel video transmission system wherein channel video segments are operated on by corresponding channel video encoders to encode said video segments into pluralities of frames organized into groups having defined frame patterns, an apparatus to effect a temporal staggering of corresponding ones of said frame groups among said channels comprising:

a frame counter to synchronize reset signals associated with said corresponding channel video encoders; and

means for providing a timing offset to ones of said channel video encoders corresponding to a selected frame stagger for given ones of said channels.

2. (withdrawn) The apparatus of claim 1 further comprising:

a plurality of registers, ones of said registers being loaded with frame offset values corresponding to said selected frame stagger for an associated channel.

3. (withdrawn) The apparatus of claim 2 further comprising:

a plurality of comparators, ones of said comparators being functionally associated with ones of said video encoders, said comparators being operative to receive as inputs an output of associated registers and of a frame rate counter, and to provide a timing signal as an output corresponding to said selected frame stagger for an associated channel.

4. (withdrawn) The apparatus of claim 3 further comprising:

a plurality of gates adapted to receive as inputs an encoder reset signal level and an output of ones of said comparators and to provide as an output a reset signal for an associated encoder, wherein ones of said encoders are reset at a timing point corresponding to the selected frame stagger for given encoders.

5. (previously presented) In a video transmission system in which video segments are encoded into a plurality of frame types, a method for arranging frame transmission alignment among a plurality of channels concurrently transmitted via a common transmission medium, comprising:

identifying a specified frame type in each of said plurality of channels; and

causing ones of said specified frame type to be arranged so as to avoid temporal alignment with other ones of said specified frame type in corresponding other ones of said plurality of channels,

wherein said video segments include a fixed number of frame positions and said fixed number of frame positions is an integer multiple of a number of said plurality of channels.

6. (original) The method of claim 5 wherein said ones of said specified frame type and other ones of said specified frame type are temporally displaced, relative to one another.

7. (original) The method of claim 5 wherein said specified frame type in successive ones of said plurality of channels are displaced by one frame position relative to a location of

said frame type in a preceding channel.

8. (cancelled)

9. (original) The method of claim 5 wherein each of said plurality of channels is synchronized to a common frame rate and phase.

10. (original) The method of claim 5 wherein said plurality of frame types include a high priority frame type and a low priority frame type.

11. (original) The method of claim 5 wherein said plurality of frame types include at least one intermediate priority frame type.

12. (original) The method of claim 11 wherein said video segments are encoded using an MPEG coding methodology and further wherein said high, intermediate and low priority frame types correspond respectively to MPEG Intra-coded, Predictive, and Bi-directionally Predictive frames.

13. (original) The method of claim 10 wherein ones of said low priority frame type are optionally dropped to reduce required transmission bandwidth.

14. (original) The method of claim 5 wherein said video segments are encoded using

an MPEG coding methodology and correspond to an MPEG Group of Pictures.

15. (previously presented) In a video transmission system in which video segments are encoded into a plurality of frame types, an apparatus for arranging frame transmission alignment among a plurality of channels concurrently transmitted via a common transmission medium, comprising:

means for identifying a specified frame type in each of said plurality of channels; and

means for causing ones of said specified frame type to be arranged so as to avoid temporal alignment with other ones of said specified frame type in corresponding other ones of said plurality of channels,

wherein said video segments include a fixed number of frame positions and said fixed number of frame positions is an integer multiple of a number of said plurality of channels.

16. (previously presented) The method of claim 5 wherein said fixed number of frame positions is equal to the number of said plurality of channels, such that the integer multiple is equal to one.

17. (previously presented) The apparatus of claim 15 wherein said fixed number of frame positions is equal to the number of said plurality of channels, such that the integer multiple is equal to one.

18. (previously presented) The method of claim 5, wherein an optimum staggering

order of said specified frame type is obtained by maintaining a distance between frames of said specified frame type at a maximum on average, in consideration of the number of said plurality of channels.

19. (previously presented) The apparatus of claim 15, wherein an optimum staggering order of said specified frame type is obtained by maintaining a distance between frames of said specified frame type at a maximum on average, in consideration of the number of said plurality of channels.

20. (previously presented) The apparatus of claim 15, wherein said causing means comprises a frame rate counter, a plurality of phase registers, and a plurality of comparators, wherein the frame rate counter has an output connected in signal communication with a first input of each of the plurality of comparators, and each of the plurality of phrase registers has a respective output that is connected in signal communication with a second input of a respective one of the plurality of comparators.

21. (previously presented) The apparatus of claim 15, wherein the video segments are operated on by corresponding ones of channel video encoders, and the frame rate counter synchronizes reset signals associated with the channel video encoders.

22. (previously presented) The apparatus of claim 21, wherein ones of the plurality of registers are loaded with frame offset values corresponding to a selected frame stagger for an

associated one of the plurality of channels.

23. (previously presented) The apparatus of claim 22 wherein ones of the plurality of comparators are functionally associated with ones of the channel video encoders, the plurality of comparators being operative to provide a timing signal as an output corresponding to the selected frame stagger for the associated one of the plurality of channels.

24. (previously presented) The apparatus of claim 23 wherein said causing means further comprises:

a plurality of gates adapted to receive as inputs an encoder reset signal level and an output of ones of the plurality of comparators and to provide as an output a reset signal for an associated one of the channel video encoders, wherein respective ones of the channel video encoders are reset at respective timing points corresponding to the selected frame stagger for a respective one of the plurality of channels.

9. RELATED EVIDENCE APPENDIX

None

10. RELATED PROCEEDINGS APPENDIX

None